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EXAMINER	
KITOV, ZEEV	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 12/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)	
	10/057,317	HOPKINSON ET AL.	
	Examiner	Art Unit	MW
	Zeev Kitov	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

IDS

Examiner acknowledges reception of IDS. All the references are entered in the file. However, some of the references provided by an Applicant are not dated. According to Rule 37 CFR 1. 98 (b) (5), "Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication" (emphasis added). Since the timing validity of these references against the instant Application was not established, they were not used as prior art in the Examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the

remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, Claims 1 and 14 recite the broad recitation "a positive temperature coefficient device", and the claim also recites "the polymer positive temperature coefficient device" which is the narrower statement of the range/limitation.

2. Additionally, Claims 10 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is because Claims 10 and 16, which are dependent on Claims 1 and 14, recite "the ceramic positive temperature coefficient device". To the best of Examiner's knowledge, the positive temperature coefficient device cannot be simultaneously polymer (Claims 1 and 14) and ceramic (Claims 10 and 16). Therefore, Claims 10 and 16 are rejected as being indefinite. For purpose of examination, it was assumed that Claims 1 and 14 do not include the limitation "the polymer positive temperature coefficient device".

3. Claims 14, 19 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A reason for that is a following statement recited in each of the Claims: "wherein the positive temperature coefficient device mounting geometry is based on trip times for the positive temperature coefficient device

in comparison to the distance the positive temperature coefficient device is mounted from the secondary winding, the type of insulated covering, the thickness of the insulated covering, and the mounting arrangement for the positive temperature coefficient device". It is not clear from the statement how the trip times can be compared to the distance, the type of isolated covering, the thickness of the covering and the mounting arrangement. The Specification does not explain the statement; it just recites the same phrase. For purpose of the Claims examination, patentable weight was not given to the statements.

4. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A reason for that is that the claim recites following limitation: "the housing has an end-bell-coil-cover portion". A meaning of the phrase is not clear. The end-bell-coil-cover form is not disclosed in the Specification. For purpose of examination a patentable weight was not given to the phrase.

Objections

Claim 24 is objected to due to a following statement: "A method comprising the steps of". It is not clear from the statement what kind of the method is claimed: the method of transformer protection, the method of manufacturing, or method of some other kind. For purpose of examination it was interpreted as the method of transformer protection.

Claims 11, 17, and 27 are objected to due to a following error: "temperature of 95 and 105 degrees Celcius". According to Specification, it is supposed to be "temperature between 95 and 105 degrees Celsius", as recited in Claim 22. For purpose of examination the phrase was interpreted according to the Specification.

Means plus function form

The claim 19 is presented in a means plus function form. According to 35 U.S.C. 112, 6th paragraph, "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof". (emphasis added).

The "means or step plus function limitation should be interpreted in a manner consistent with the specification disclosure.

Factor supporting an equivalency conclusion:

A) The prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (FED. Cir. 2000).

B) A person of ordinary skill in the art would have recognized the interchangeability of the element shown in the prior art for the corresponding element

disclosed in the specification. *Caterpilar Inc. v. Deer & Co.,* 224 F.3d 1374, 56 USPQ2d 1305 (FED. Cir. 2000).

C) There are insubstantial differences between the prior art element and the corresponding element disclosed in the specification. *IMS Technology, Inc. v. Haas Automation, Inc.,* 206 F.3d 1422, 1436, 54 USPQ2d 1129, 1138 (Fed. Cir. 2000).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14, 15, 19, 20, 22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann (US 6,243,276) in a view of Yamada et al. (US 5,174,924). Regarding Claims 14, 19 and 24, Neumann discloses most of the elements of the claims including a transformer having a primary and a secondary winding (elements 14 and 16 in Fig. 2), the secondary winding having a first and a second terminal (shown in Fig. 2), both the primary and the secondary windings have an isolated covering (element 76 in Fig. 6 and 8, col. 5,lines 25 – 32) and a positive temperature coefficient device (element 42 in Fig. 2, col. 3, line 66 – col. 4, line 4). However, it does not disclose the polymer PTC and it's positioning. Yamada et al. disclose the polymer positive temperature coefficient device connected to the first terminal of the transformer secondary winding (elements 3 in Fig. 4 and 5, col. 17, lines

44 – 52), which is mounted in the housing (col. 9, lines 11 – 17). As to the PTC positioning, Examiner takes an Official Notice that to ensure proper action of the thermo sensors, they must be positioned as close as possible to the heated object.

Both patents have the same problem solving area, namely providing overcurrent protection for electrical systems. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Neumann solution by adding polymeric PTC mounted in the housing, because (i) as Yamada et al. state (col. 1, line 54 – col. 2, line 17), the polymeric PTC have excellent resistance switching under temperature properties and (ii) to adequately protect the heated object, the PTC sensor must be placed as close as possible to the heated the object. If placed outside the enclosure, the PTC would be unable to protect the transformer.

Regarding Claim 19, it was treated in accordance with the rules of equivalency stated above.

Regarding Claims 15, 20 and 25, Yamada et al. disclose the polymeric PTC, see Claims 14, 19 and 24 rejections.

Claims 17, 22, and 27, are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al. and further in a view of Watkins et al. (US 5,862,030). Regarding Claims 17, 22, and 27, Yamada et al. disclose the polymeric PTC having the trip temperatures of 80 – 89 and 118 – 121 degrees Celsius (see Tables 2 – 4). Watkins et al. disclose the polymeric PTC having the tripping point

between 75 and 200 degrees centigrade (col. 3, lines 7- 30). Examiner takes an Official Notice that the critical temperature in the transformer design is defined mostly by the winding wires isolation maximum temperature, and therefore the PTC tripping point is to be set accordingly. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using the PTC having the tripping point between 75 and 200 degrees according to Watkins et al. because it is defined by the winding isolation thermal properties.

Claims 16, 18, 21, 23, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al. and further in a view Doyle et al. (WO 92/10072). As was stated above, Neumann and Yamada et al. disclose all the elements of Claims 14,19, and 24. However, regarding Claims 18, 23 and 28 they do not disclose mounting the PTC device using the crimp joint. Doyle et al. disclose mounting the PTC device using the crimp joint (see Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using crimp joint for the PTC attachment, because of its well known low cost.

Regarding Claims 16, 21 and 26, Doyle et al. disclose use the ceramic PTC (page 3, lines 3 – 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using the ceramic slab material for the PTC, because of its ability to withstand high temperature without degradation of the parameters. Actually, both types

polymeric and ceramic are widely used today for this purpose. Selection of particular type of PTC is a designer choice.

Claims 1, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al. and further in a view of D. Steinberg textbook, Cooling Techniques for Electronic Equipment. Claim 1 differs from Claims 14, 19 and 24 by its limitation of a specific positioning of the polymer PTC with respect to the second winding, which is disclosed by neither Neumann, nor Yamada et al. As well known in the art of thermal design, in order to protect equipment against high temperature, the sensor/protector should be exposed to a reasonably possible exact temperature of the object. Otherwise, it would react to the temperature different from real and subsequently the object could be in danger of overheating. Therefore, the PTC attachment to the transformer winding should be done such that the PTC would have the temperature as close as possible to the transformer winding. D. Steinberg in his textbook discloses the formula for calculation of the temperature drop in the metal connection (formulas 3.1, 3.2 and Part 2 example of calculation, pages 36 – 38), showing that the temperature drop is directly proportional to the length of metal connection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by attaching the PTC to the winding as close as possible to the winding terminal. As to particular numerical distances, it is obvious engineering choice, based on the PTC and its leads dimensions.

Regarding Claim 9, Yamada et al. disclose the polymer positive temperature coefficient device connected to the first terminal of the transformer secondary winding (elements 3 in Fig. 4 and 5, col. 17, lines 44 – 52), which is mounted in the housing (col. 9, lines 11 – 17).

As per Claim 13, it differs from Claim 1 by its limitation of the PTC device being Raychem RUE device. The latter device was interpreted according to the Applicant provided Data in a copy of Short-Form Catalog, November 2001. Yamada et al. disclose the polymer PTC devices, which are functionally equivalent to the Raychem RUE devices (see Tables 2 – 4).

Claims 2 - 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook, and further in a view of Harrison (US 4,951,168). As was stated above, Neumann, Yamada et al. and D. Steinberg textbook disclose all the elements of Claim 1. However, regarding Claims 2 and 4, they do not explicitly disclose the transformer as a NEMA class 2 transformer. According to the Specification, the NEMA class 2 transformers defined as transformers that are provided with an overcurrent protective device that limits the transformer output current to a thermally safe maximum value. Class 2 transformers generally have power ratings of 20-75 VA. Harrison discloses transformers having overload protection (see Fig. 9 – 11) and rated at 40 - 75 VA (col. 9, lines 3 – 5, 52 – 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by changing his transformer to the

NEMA class 2 transformer, because (i) according to Harrison (col. 2, lines 38 – 68), such transformers require the overheating protection, (ii) Neumann provides an improved tool for such protection, the PTC device (element 42 in Fig. 2), and (iii) inclusion of the NEMA transformers into the list would expand their business. At the same time, compliance with the industrial standards is a routine designer's task, which does not represent either innovation, or inventive step.

Regarding Claim 3, Examiner takes an Official Notice that the transformers with 24 volts output are widely used in modern practice. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by adjusting the transformer output to 24 volts, because this value is widely used by customers. Such adaptation would expand the business scope of the manufacturing company.

Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook and further in a view of Cook et al. (US 4,000,483). As was stated above, Neumann, Yamada et al. and d. Steinberg disclose all the elements of Claim 1. However, regarding Claim 5, they do not disclose the plastic housing. Cook et al. disclose the plastic housing (elements 50 and 51 in Fig. 1, col. 3, line 54 – col. 4, line 37) provided individually to each of the windings. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by adding the plastic cover to the first and second windings according to Cook et al., because as Cook

et al state (see Abstract), it will provide additional insulation between the primary coil and the laminations and between the primary and secondary coils.

Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook and further in a view of Harrison (US 4,951,168). Regarding Claim 6, Neumann, Yamada et al. and Steinberg do not disclose placing the PTC inside the plastic cover. Harrison discloses placing the thermal fuse directly on the surface of the winding (col. 6, lines 59 – 64). By analogy, the PTC element is to be placed as close as possible to the winding in order to better react to the winding temperature. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann by placing the PTC element inside the cover, because as Harrison states (col. 6, lines 59 – 64), that will ensure that the element will sense and be responsive to the temperature of that winding.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook and further in a view of common design practice. The claim introduces a limitation of the insulating covering being of 0.25 mm thick. It is common knowledge in the art of transformer design, that the insulation thickness is selected according to the specified breakdown voltage and depends on dielectric properties of the material and its thickness. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to have further modified the Neumann solution by using a proper insulating material and adjusting its thickness to 0.25 mm, when a combination of the dielectric properties of the insulation and the specified breakdown voltage require that.

Regarding Claim 8, requiring the insulation being a class B insulation, it is well known in the art, that according to current industrial standards, the Class B insulation should withstand up to 130 degrees Celsius. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using the class B insulation, because as well known in the art, in overcurrent conditions, the windings, especially the secondary winding, get substantial heat. Compliance with the industrial standard will improve the transformer endurance. At the same time, compliance with the industrial standards is a routine task of designer and does not represent either innovation or inventive step.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook, and further in a view Doyle et al. As was stated above, Neumann Yamada et al. and D. Steinberg textbook disclose all the elements of Claim 1. However, regarding Claim 10, they do not disclose the ceramic PTC element. Doyle et al. disclose use the ceramic PTC (page 3, lines 3 – 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using the ceramic slab material for the PTC, because of its ability to withstand high temperature without degradation of the parameters. Actually, both types polymeric and ceramic are

widely used today for this purpose. Selection of particular type of PTC is a designer choice.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook and further in a view of Watkins et al. (US 5,862,030). Regarding Claim 11, Yamada et al. disclose the polymeric PTC having the trip temperatures of 80 – 89 and 118 – 121 degrees Celsius (see Tables 2 – 4). Watkins et al. disclose the polymeric PTC having the tripping point between 75 and 200 degrees centigrade (col. 3, lines 7- 30). Examiner takes an Official Notice that the critical temperature in the transformer design is defined mostly by the winding wires isolation maximum temperature, and therefore the PTC tripping point is to be set accordingly. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Neumann solution by using the PTC having the tripping point between 75 and 200 degrees according to Watkins et al. because it is defined by the winding isolation thermal properties.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neumann in a view of Yamada et al., D. Steinberg textbook and further in a view Doyle et al. As was stated above, Neumann, Yamada et al. and d. Steinberg disclose all the elements of Claim 1. However, regarding Claim12, they do not disclose mounting the PTC device using the crimp joint. Doyle et al. disclose mounting the PTC device using the crimp joint (see Abstract). Therefore, it would have been obvious to one of ordinary

skill in the art at the time the invention was made to have further modified the Neumann solution by using crimp joint for the PTC attachment, because of its well known low cost.

Conclusion

The prior art made of record not relied upon is considered pertinent to applicant's disclosure: US 4,810,991, US 3,631,322, US 6,072,679.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose telephone number is (703) 305-0759. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703) 308-3119. The fax phone number for organization where this application or proceedings is assigned is (703) 872-9306 for all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Z.K.
12/04/2003

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